

**IN THE CLAIMS:**

1. (Currently Amended) A target tracking method comprising:

optically tracking a target within a first image;

~~illuminating a light source~~ applying one or more modulated optical beams within the first image;

stabilizing the first image to generate a second image;

comparing the ~~illuminated light source~~ one or more modulated optical beams with a portion of a starfield pattern within the second image; and

determining inertial information of the tracked object based on the comparison.

2. (Currently Amended) The method of Claim 1, wherein the ~~illuminated light source~~ one or more modulated optical beams is referenced to the optically tracked target.

3. (Cancelled)

4. (Original) The method of Claim 1, wherein determining inertial reference information includes further determining inertial reference information based on platform information.

5. (Original) The method of Claim 4, wherein the platform is a satellite.

6. (Original) The method of Claim 4, wherein the platform is an aircraft.

7. (Original) The method of Claim 4, wherein the platform is a ground based system.

8. (Original) The method of Claim 7, wherein the ground based system is a vehicle.

9. (Original) A targeting platform comprising:  
a target tracking system including:


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a database for storing starfield information;

an optical beam source configured to illuminate one or more optical beam pulses;

a first camera system configured to track an object and record the tracked object;

a second camera system configured to stabilize a tracking image received by a portion of the first camera system and record the stabilized image that includes the one or more optical beam pulses; and

a processor coupled to the database, the optical beam source, and the first and second camera systems, the processor including:

- a first component configured to instruct the first camera system to track the object based on recordation of the tracked object;
- a second component configured to instruct the second camera system to stabilize the tracking image based on the instructions sent to the first camera system; and
- a third component configured to determine inertial reference information of the tracked object based on the stabilized image and starfield information associated with the stabilized image.

10. (Original) The platform of Claim 9, further comprising:

one or more platform information sources coupled to the target tracking system, the one or more platform information sources being configured to send platform information to the target tracking system,

wherein the third component is configured to further determine inertial reference information based on platform information.



11. (Original) The platform of Claim 9, wherein the first camera system includes:
- a first fast steering mirror configured to track the object based on instructions from the first component; and
  - a first camera configured to record an image reflected by the fast steering mirror and send the recorded image to the first component.
12. (Original) The platform of Claim 11, wherein the second camera system includes:
- a second fast steering mirror configured to stabilize the image reflected by the first fast steering mirror based on instructions sent from the second component; and
  - a second camera configured to record an image reflected by the second fast steering mirror and send the recorded image to the third component.
13. (Original) The platform of Claim 9, wherein the platform is a satellite.
14. (Original) The platform of Claim 9, wherein the platform is an aircraft.
15. (Original) The platform of Claim 9, wherein the platform is a ground based system.
16. (Original) The platform of Claim 15, wherein the ground based system is a vehicle.
17. (Original) A target tracking system comprising:
- a database for storing starfield information;
  - an optical beam source configured to illuminate one or more optical beam pulses;
  - a first camera system configured to track an object and record the tracked object;
  - a second camera system configured to stabilize a tracking image received by a portion of the first camera system and record the stabilized image that includes the one or more optical beam pulses; and



a processor coupled to the database, the optical beam source, and the first and second camera systems, the processor including:

- a first component configured to instruct the first camera system to track the object based on recordation of the tracked object;
- a second component configured to instruct the second camera system to stabilize the tracking image based on the instructions sent to the first camera system; and
- a third component configured to determine inertial reference information of the tracked object based on the stabilized image and starfield information associated with the stabilized image.

18. (Original) The system of Claim 17, wherein the third component is configured to further determine inertial reference information based on received platform information.

19. (Original) The system of Claim 17, wherein the first camera system includes:

- a first fast steering mirror configured to track the object based on instructions from the first component; and
- a first camera configured to record an image reflected by the fast steering mirror and send the recorded image to the first component.

20. (Original) The system of Claim 19, wherein the second camera system includes:

- a second fast steering mirror configured to stabilize the image reflected by the first fast steering mirror based on instructions sent from the second component; and
- a second camera configured to record an image reflected by the second fast steering mirror and send the recorded image to the third component.

21. (Currently Amended) A target tracking system comprising:

- means for optically tracking a target within a first image;



means for ~~illuminating a light source~~ applying one or more modulated optical beams  
within the first image;

means for stabilizing the first image to create a second image;

means for comparing the ~~illuminated light source~~ one or more modulated optical  
beams with a portion of a starfield pattern within the second image; and

means for determining inertial reference information of the tracked object based on  
the comparison.

22. (Currently Amended) The system of Claim 21, wherein the ~~illuminated light source~~ one  
or more modulated optical beams is referenced to the optically tracked target.

23. (Cancelled)

24. (Original) The system of Claim 21, wherein the means for determining inertial  
reference information includes means for determining inertial reference information based on  
platform information.

25. (Original) The system of Claim 24, wherein the platform is a satellite.

26. (Original) The system of Claim 24, wherein the platform is an aircraft.

27. (Original) The system of Claim 24, wherein the platform is a ground based system.

28. (Previously Presented) The system of Claim 27, wherein the ground based system  
is a vehicle.